

RESIDUE MANAGEMENT, - NO-TILL AND STRIP TILL (Acres) CODE 329A

DEFINITION

Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year-round, while growing crops in previously untilled soil and residue.

PURPOSE

This practice may be applied as part of a conservation management system to support one or more of the following:

- * Reduce sheet and rill erosion.
- * Reduce wind erosion.
- * Maintain or improve soil organic matter content.
- * Improve surface water quality by reducing pesticide and sediment movement
- * Conserve soil moisture.
- * Manage snow to increase plant available moisture or reduce plant damage from freezing or desiccation.
- * Provide food and escape cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are grown.

This standard includes tillage and planting methods commonly referred to as no-till, zero till, slot plant, row till, zone till, or strip till.

CRITERIA

General Criteria Applicable To All Purposes Above

Loose residue to be retained on the field shall be uniformly distributed on the soil surface. Where combines or similar machines are used for harvesting, they shall be equipped with spreaders capable of distributing residue over at least 80 percent of the working width of the header.

Residue shall not be burned except under special operation and maintenance conditions or disturbed by full width tillage operations except as follows: planters or drills shall be equipped to plant directly through untilled residue or in a tilled seedbed prepared in a narrow strip along each row by rotary tillers, sweeps, multiple coulters, row cleaning devices or knives.

If row cultivation or spot treatment for weed escapes, leveling ruts, or similar operations become necessary, tillage shall be limited to undercutting operations which minimize burial of surface residue.

Cover crops may be used to increase soil cover or residue to meet planned soil loss objectives.

Additional Criteria To Reduce Sheet and Rill Erosion

The amount of residue needed to reduce erosion within the soil loss tolerance (T) or any other planned soil loss objective, shall be determined using current approved erosion prediction technology such as RUSLE in the Michigan NRCS Field Office Technical Guide (FOTG) Water Erosion Prediction Section I-C. Partial removal of residue by baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system.

Seedbed preparation, planting, and fertilizer placement shall disturb no more than one fourth of the row width. The row area formed by the planting operation shall be level with or slightly above the adjacent row middles unless the rows are planted on the contour. *For additional information on water erosion control ideas SEE MSU E, Bulletin E-2315.*

Additional Criteria To Reduce Wind Erosion

The amount and orientation of residue needed to reduce erosion within the soil loss tolerance (T) or other planned soil loss objective shall be determined using current approved wind erosion prediction technology or the NRCS FOTG Wind Erosion Prediction, Section I-A. Partial removal of residue by baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system. For additional information on wind erosion control ideas SEE MSU E, Bulletin E-2314.

Additional Criteria to Maintain Or Improve Soil Organic Matter Content

The amount of residue needed to achieve the desired soil condition, shall be determined using the current approved soil conditioning index procedure. Partial removal of residue by baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Improve Surface Water Quality by Reducing Pesticide and Sediment Movement

The amount of residue needed to reduce erosion within the soil loss tolerance (T) or any other planned soil loss objective, shall be determined using current approved erosion prediction technology.

Where the potential for runoff exists, inject, surface band or sidedress nitrogen rather than surface broadcast N to prevent nitrate contamination of surface water runoff from no-till management.

If the slope is greater than 2 percent, select pesticides with lower potential for surface movement to prevent pesticide contamination of surface water from no till management. *See the SCS Soil-Pesticide Interaction Screening Potential Pesticide Loss to Surface Runoff Matrix to evaluate the relative loss of pesticides from fields, based on soil, site and chemical characteristics.*

Additional Criteria To Conserve Soil Moisture

A minimum quantity of 50 percent residue cover shall be maintained throughout the growing season. Residue shall be evenly distributed and maintained on the soil surface. Partial removal of residue by baling or grazing shall be limited to retain the amount needed.

Additional Criteria to Manage Snow to Increase Plant Available Moisture or Reduce Plant Damage From Freezing or Desiccation

Stubble shall be left standing as high as possible by the harvesting operation, but not less than 6 inches in any case. Stubble shall be maintained standing over winter to trap and retain snow. Loose residue may be removed providing that the remaining residue is left standing.

When crops are planted residue will not be removed from more than one fifth of the row width, unless provisions are provided to redistribute residue over the row.

Additional Criteria To Provide Food And Escape Cover For Wildlife

Residue height, amount, and time period shall be determined using the Interim Michigan NRCS Standard: Wildlife Cover and Food Development. Residues shall not be removed unless it is determined by the habitat evaluation procedure that removal would not adversely affect habitat values. Stubble shall be maintained standing over winter in order to maintain waste grain on the soil surface during winter.

CONSIDERATIONS

No till or strip till may be practiced continuously throughout the crop sequence, or may be managed as part of a system which includes other tillage and planting methods such as mulch till. *Selection of acceptable tillage methods for specific site conditions may be aided by referring to SCS Agronomy Technical Note 8,9,15,16,17,18,22,30 and MSU E Bulletins E1041, E1042, E1123, E1616, E1251, E1460, E1525, E2107, E2185, E2258, E2337, E2418, NCH22, NCH53, and NCR202.*

Production of adequate amounts of crop residue necessary for the proper functioning of this practice can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, strawy manure and adjustment of plant populations or row spacings.

Maintaining a continuous no-till system will maximize the improvement of soil organic matter content. Also, when no-till is practiced continuously, soil reconsolidation provides additional resistance to sheet and rill erosion.

Depending on slope, soil type and residue cover, no-till may reduce sediment loss up to 90% compared to conventional tillage.

The effectiveness of stubble to trap snow or reduce plant damage from freezing or desiccation increases with stubble height. Variable height stubble patterns may be created to further increase snow storage.

The value of residue for wildlife habitat can be enhanced by either leaving rows of unharvested crop or crop residue standing at intervals across the field.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and O&M described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Where residue accumulates greater than 2 inches deep due to weather related causes, such as runoff or flooding, consider one of the following operations prior to planting:

- 1/ tilling or burying residue
- 2/ baling the residue
- 3/ loading the residue in a manure spreader and spreading it over a larger area.
- 4/ spot burning

Try to maintain even amounts of residue on driveways, headlands, loading areas etc.

Where possible avoid burying waterways with residue.

High residue amounts may require one of the following options to improve crop stands: baling, light disking, or strip tilling with a coulters cart, tripple coulters, residue managers, etc.

Chaff spreaders on combines should be set to distribute residue as wide as the header. Combines equipped with headers wider than 15 feet require a chaff spreader to prevent windrowing of chaff and residue.